Deforestation in California: a poorly understood GHG emission source and emission reduction opportunity

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Urban Development in CA

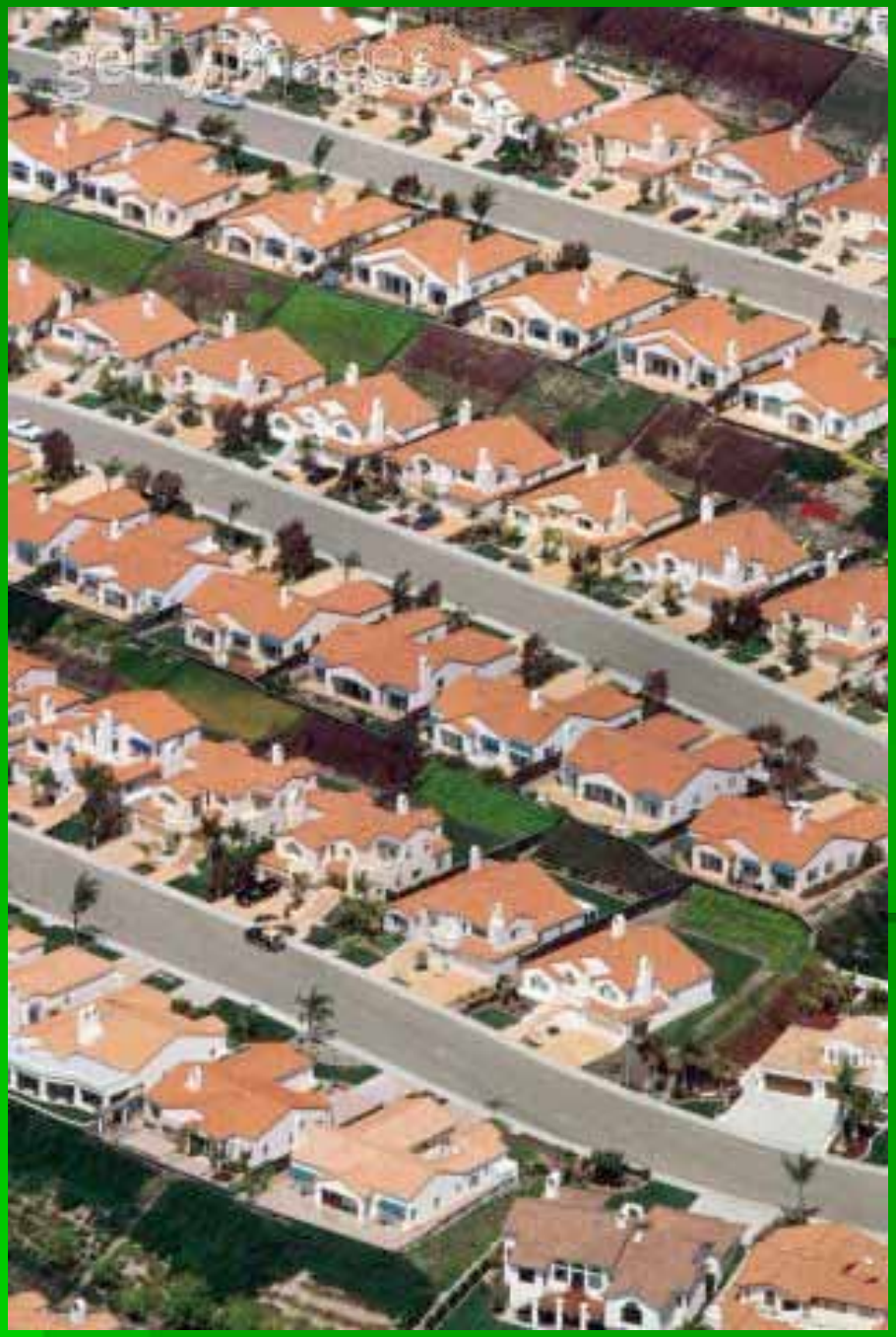
- 252% increase in urban area in CA over the last 40 years
- California has:
  - Lowest number of developed acres per capita, but
  - Second highest population growth rate and
  - An average income growth rate that outstrips population growth

The issue

- Forests cleared in and around urban areas as a result of development
- No standard methodology to track loss of trees, woodlands and forests
- Remote sensing is too coarse for small to medium-scale development
- No knowledge of emissions consequences of development
  - What proportion of trees are removed
  - What is the destination of removed biomass

Benefits of greater understanding

- Improved statewide GHG accounting
- Opportunities for climate change mitigation
- Opportunities for climate change adaptation



"I gotta knock 'em down, but don't worry, we're going to name all the streets after trees."

Study Outline

1. Desk Study
2. Spatial Study on Deforestation
3. Study on Emissions Associated with Deforestation
4. Economic Assessment of Development Choices
5. Political and Carbon Project Aspects

Desk Study

Task 2: Analyze deforestation across California. Assess the relative forms of development including centralized versus dispersed development, and development on open land versus existing forest land

Conversion of Forest to Development

Urban Forests

- The ratio of planting to removal is decreasing
- Opportunity to increase forest cover exists

Wildland Urban Interface

- More area developed in the "intermix"
- Deforestation in the intermix might not be well captured

Site Preparation Practices

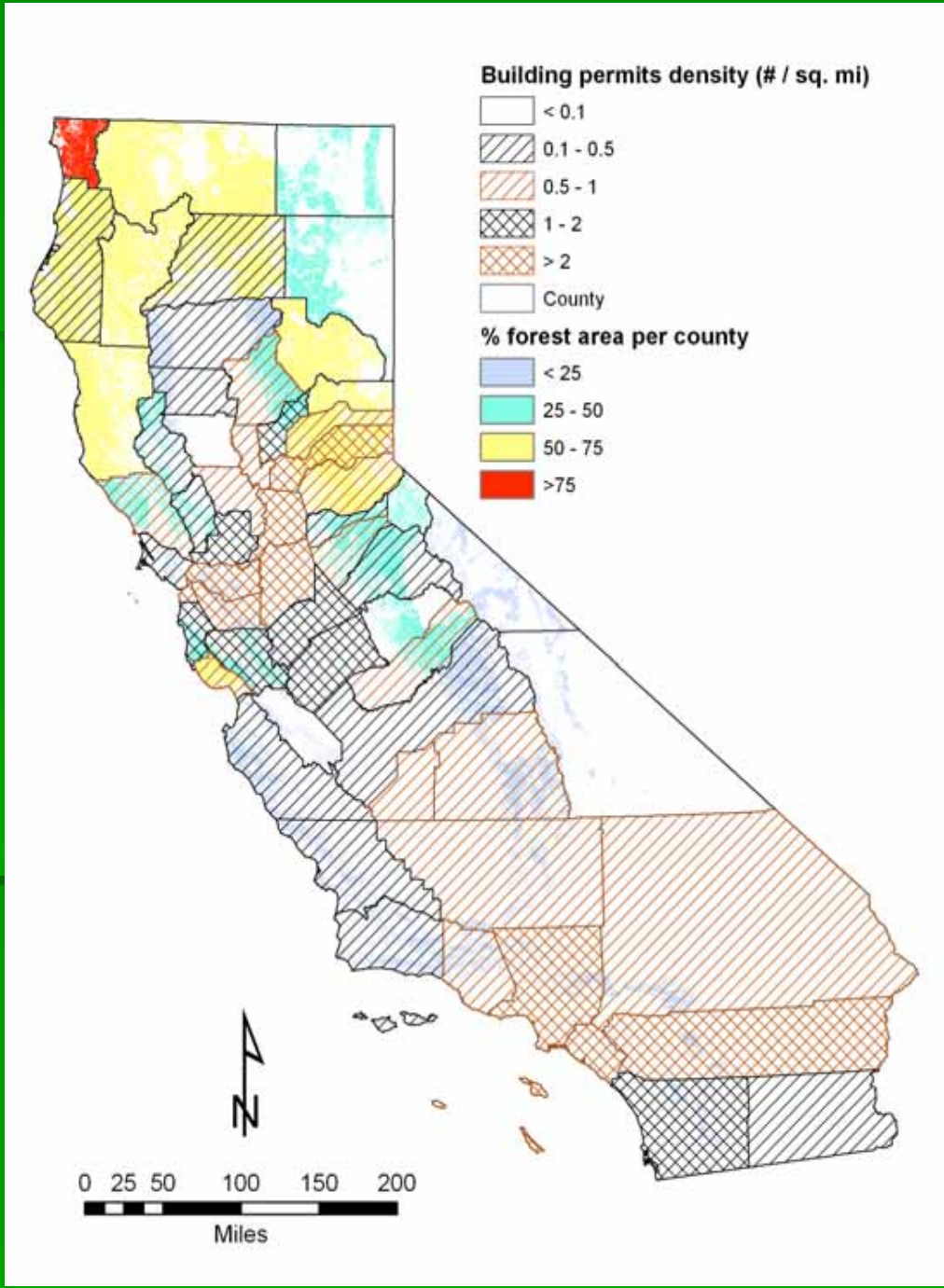
- Vegetation removal and grading is regulated by local ordinances as well as CEQA provisions
- Environmental Impact Assessments may be used to identify site preparation activities for specific development projects
- Studies of urban woody waste disposal were used to predict the fate of vegetation removed from development sites

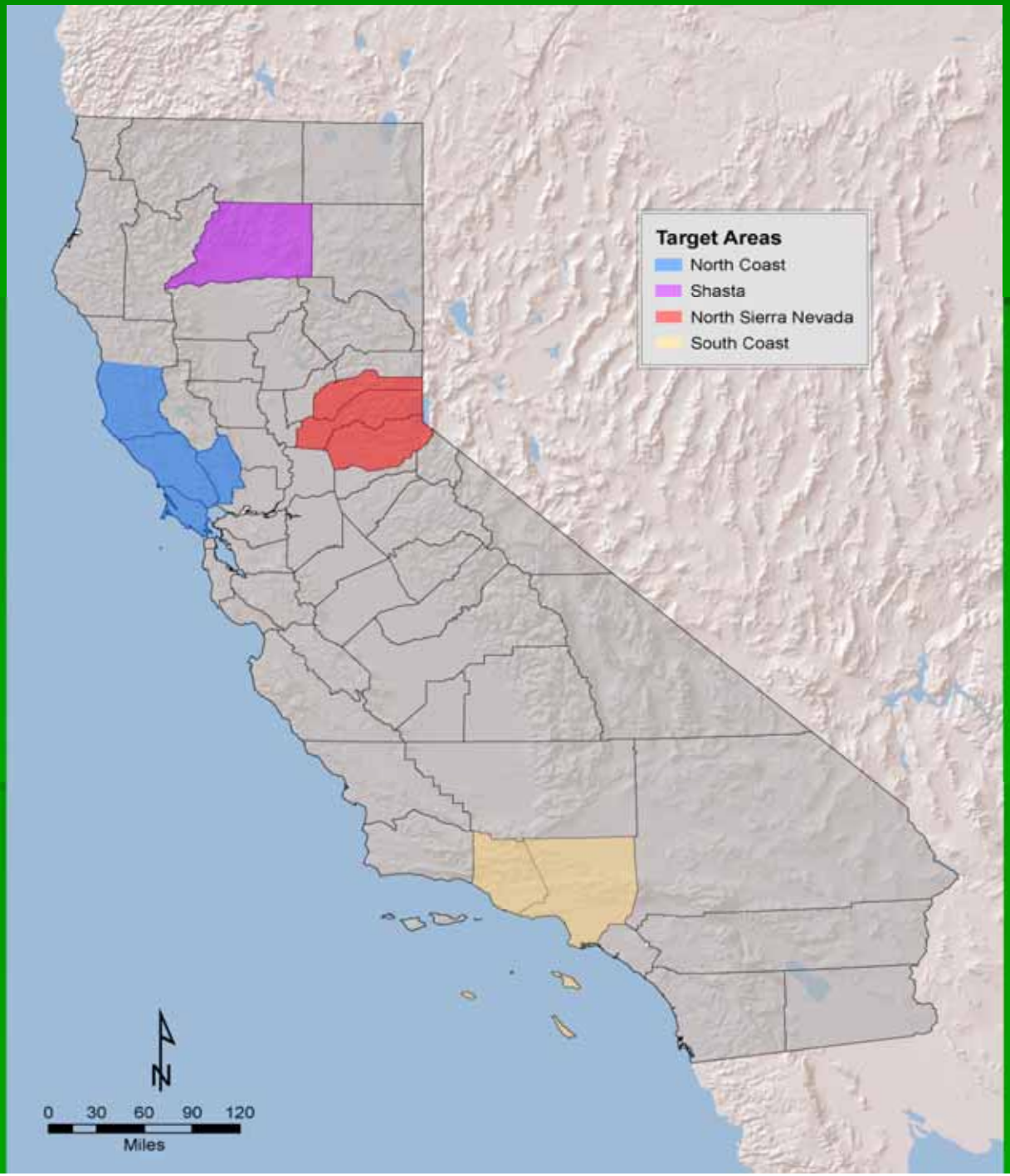
Spatial Analysis

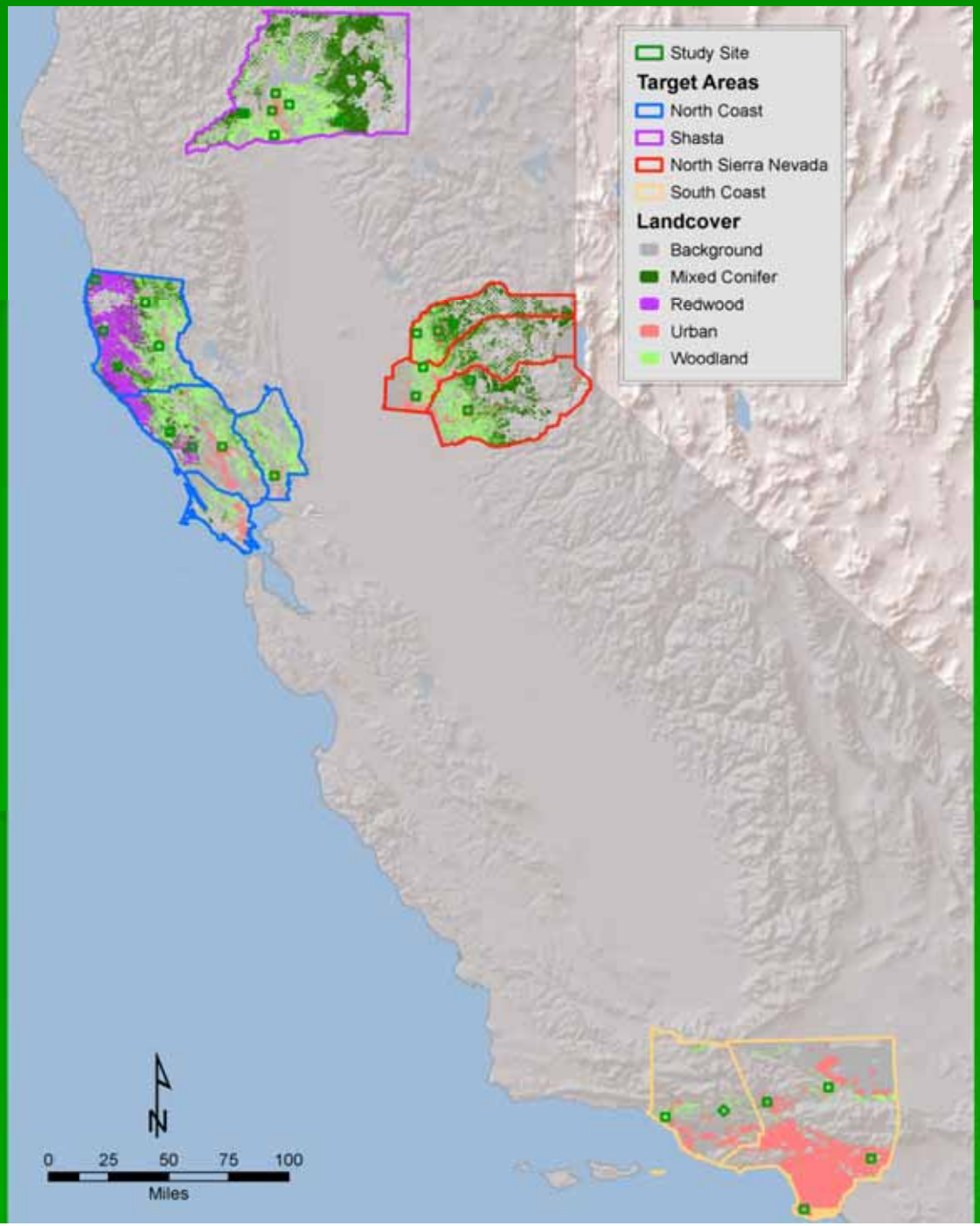
Task 3: Assess annual deforestation across California and develop a methodology for assessment using coarser-scale imagery typically used

Identification of Study Sites

- We analyzed the U.S Census Bureau Building Permits data from 2005 to 2007.
- Forest land was overlaid with 2005-2007 building permit density.




Target Areas
North Coast
Shasta
North Sierra Nevada
South Coast
N
0 30 60 90 120
Miles


Study Site
Target Areas
North Coast
Shasta
North Sierra Nevada
South Coast
Landcover
Background
Mixed Conifer
Redwood
Urban
Woodland
N
0 25 50 75 100
Miles

Spatial Analysis

- 4 Study Regions
- Examination of satellite imagery
  - Landsat – 30m resolution
  - Quickbird – 60cm resolution
- Creation of factors linking deforestation at coarse scale with actual deforestation for each region?

Emissions Assessment

Task 4: Assess carbon emissions associated with deforestation and develop emission factors for future analyses

Emissions Assessment

- Same 4 study regions
- Fieldwork assessing carbon stocks at development sites
- Chronosequences of before, immediately after and some years after development
- Work with developers to detail fate of cut biomass and plans for tree planting in developed sites
- Analysis of benefits of remaining trees for reduced heating and cooling needs

Economic Analysis

Task 5: Economic analysis of development in California

Economic Analysis

- What are the economic decisions that developers make with regard to:
  - Retaining or removing tree cover
  - Density of development
  - Distance of development from urban areas

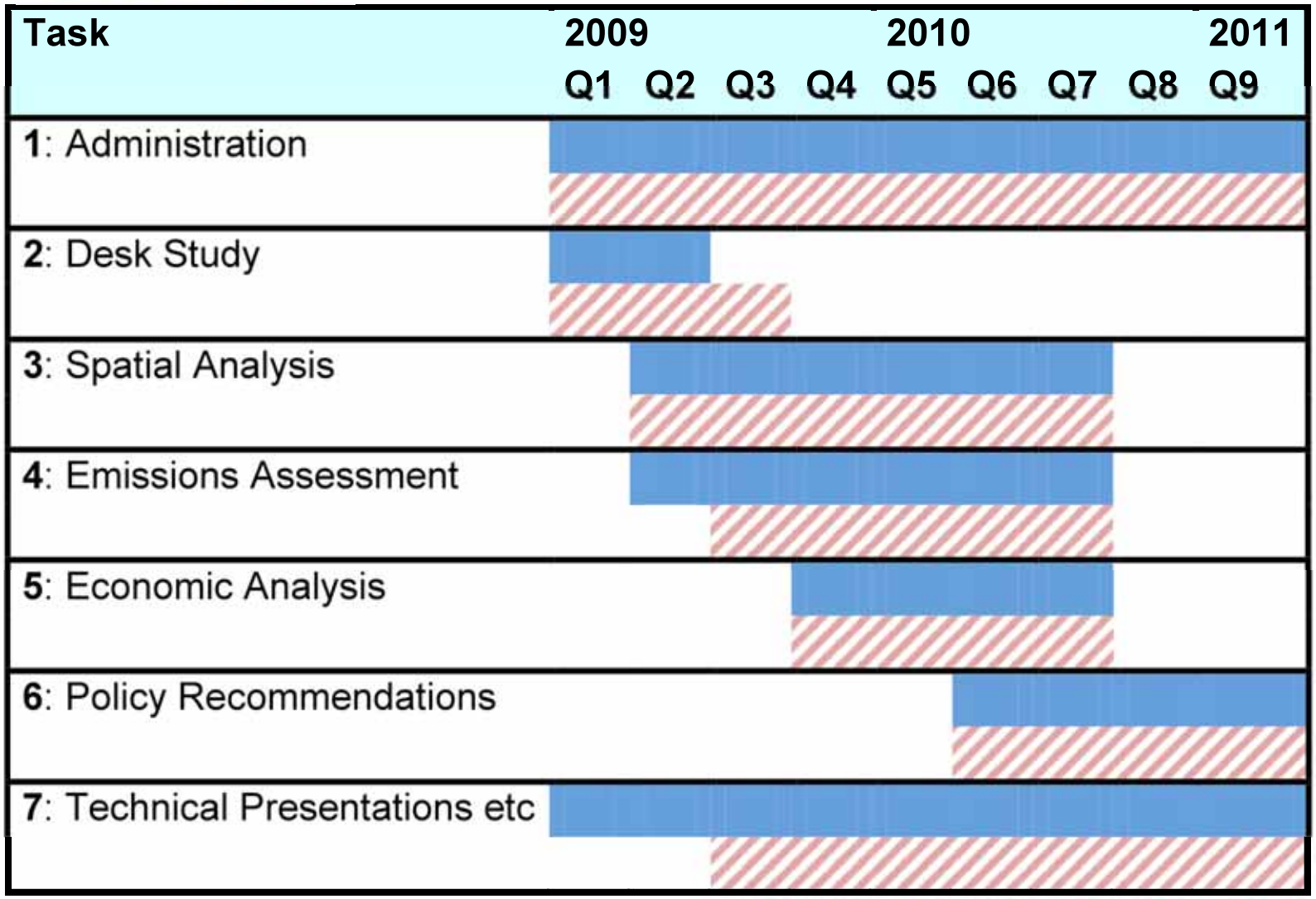
Policy / Carbon Project Standards

Task 6: Policy recommendations for reducing emissions from development across California

Policy / Carbon Project Standards

- Provide policy recommendations that will reduce emissions from deforestation for urban development and will increase sequestration.
- The recommendations will also consider the implications for a future changed climate
- To propose a methodology for carbon projects to decrease emissions from deforestation

Timeline


Task
2009
2010
2011
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
1: Administration
2: Desk Study
3: Spatial Analysis
4: Emissions Assessment
5: Economic Analysis
6: Policy Recommendations
7: Technical Presentations etc

For more information, contact Tim Pearson

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